What is claimed is:

1. A method for densification of a thermal spray coating comprising:

depositing a thermal spray coating on a substrate; and

mixing the thermal spray coating and the substrate by friction stir welding.

2. The method of claim 1, wherein the mixing causes metal flow of the thermal spray coating to a depth controlled by a nib of a weld tool into the substrate.

3. The method of claim 1, wherein the thermal spray coating is deposited by as a plasma spray.

4. The method of claim 1, wherein the thermal spray coating is deposited by oxy-fuel combustion acceleration of a powder feedstock.

5. The method of claim 1, wherein the thermal spray coating is deposited by two-wire electric arc spray.

6. The method of claim 1, wherein the substrate is a ferrous alloy.

7. The method of claim 1, wherein the substrate is a non-ferrous alloy.

8. The method of claim 1, wherein a thermal spray coating is a ceramic, a carbide, a metal, a composite, or a plastics.

9. The method of claim 1, further comprising determining a time between depositing the thermal spray coating and the friction stir welding according to a distance between a spray gun of a thermal spray system and a tool of a friction stir welding system and a speed of the substrate relative to the spray gun and tool.

10. A system for densification of a thermal spray coating comprising:

a first thermal spray gun for depositing a first coating on a substrate; and

a densification tool for mixing the coating and the substrate.

11. The system of claim 10, wherein the densification tool is housed in a protective tube.

12. The system of claim 11, wherein the tube is ceramic.

13. The system of claim 10, further comprising a second thermal spray gun.

14. The system of claim 13, wherein the first thermal spray gun applies the first coating before mixing and the second thermal spray gun applies a second coating after mixing.

15. The system of claim 10, wherein the first thermal spray gun and the densification tool are fixed relative to one another, and are moveable relative to the substrate.